

The role of the osteoclast in osteoarthritis

Introduction

Osteoarthritis is a devastating joint disease, characterized by joint pain and erosion of the cartilage in the joint. However, an underestimated aspect of osteoarthritis is the changes occurring in the underlying bone (subchondral bone).

These changes are not very well-characterized; however, appear to include accelerated bone turnover, leading to increased bone destruction (resorption), but also increased bone formation. The reason for the acceleration of bone formation is unknown, but appears to reside in the communication between osteoclasts and osteoblasts. Interestingly, the accelerated bone destruction is linked to the pain in the affected knees, through processes yet to be completely understood.

At Nordic we have developed an *in vivo* model of inactive osteoclasts, and this model has the potential to elucidate the role of osteoclasts in osteoarthritis.

Aims of the project:

Characterize the role of osteoclasts in osteoarthritis with respect to bone destruction, bone formation and pain in the subchondral region.

Study the interplay between osteoclasts on healthy bone and osteoarthritic bone with respect to both expression profiles and communication with osteoblasts using a series of *in vitro* experiments.

Methods:

Animal model of osteoarthritis (destabilization of the medial meniscus), including pain testing.

Culture of human osteoclasts on different substrates, culture of osteoblasts, ELISA, bone resorption assays, RNA extraction, bone formation assays, various staining methods.

References:

Henriksen K et al, Bone, 2012; 51(3):353-61.

Sondergaard BC et al. Osteoarthritis Cartilage. 2012;20(2):136-43.

Henriksen K et al, PLOS One, 2011;6(11):e27482.

Henriksen K et al, Endo Revs, 2011;32(1):31-63

Description of the company:

Nordic Bioscience is an expanding biotech company doing research in several areas: osteoporosis, arthritis, cardio vascular diseases, fibrotic diseases, cancer, Alzheimer's and diabetes. The student will be a part of a very dynamic and young team, with a high publication rate. We offer an attractive research climate with several master and PhD students. In return, a high level of engagement is expected from the student.

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